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ABSTRACT

This publication contains papers contributed by Russian educators at a symposium on preparing Soviet youth and adults for the challenges and opportunities of an emerging market economy. The following presentations are included: "Conception of Kazan Community College" (Mirza I. Makhmoutov, Oleg E. Liseitchikov, and Viktor I. Lebedev); "Complex Didactic Subject Support" (Dilyara M. Shakirova); and "Strategies of Professional Education and Vocational Training Organizational Structure Development in the USSR and Technically Advanced Nations: Comparative Aspects" (Lily I. Gurije). Two commentaries also are included: "Socio-Psychological Approach to the Governance of the Pedagogical Staff in a Vocational School" (Rafail H. Shakurov) and "Problems of Staff Retraining for Small and Medium Businesses Converting to a Market Economy" (Valentin Kharitonov). (KC)

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Special Publication Number 65

# Enhancing the Teaching and Learning Environment in the USSR

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- opportunities for disadvantaged and special populations to succeed in education, training, and work environments
- short- and long-range planning for education and training agencies
- approaches to enhancing economic development and job creation

Special Publication Number 65

# Enhancing the Teaching and Learning Environment in the USSR

Second Annual Soviet-American Symposium
on Teaching and Learning
Jacksonville, Florida

**Co-Sponsored By:**

Community Colleges for International Development
and
Center on Education and Training for Employment
The Ohio State University

October 3-4, 1991

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# Preface

The Second Annual Soviet-American Symposium on Teaching and Learning was held in Jacksonville, Florida, on October 2-4, 1991. The symposium, hosted by Florida Community College at Jacksonville, focused on the theme, *Enhancing the Teaching and Learning Environment*, with particular emphasis on preparing Soviet youth and adults for the challenges and opportunities of their emerging market economy. The annual symposiums are jointly sponsored by the Institute of Specialized Secondary Education, USSR Academy of Pedagogical Sciences; Community Colleges for International Development, Inc.; and Center on Education and Training for Employment, The Ohio State University.

Both American and Soviet educational speciâlists contributed to the dialogue of the symposium. This paper presents the views of our Russian colleagues who contributed to the success of the initiative. The Third Annual Russian-American Symposium on Teaching and Learning is planned for October 5-16, 1992, in Kazan, Tatarstan, USSR.

# Foreword

Democratic reforms have been accompanied by great social, economic, and political changes. The issue of intellectual *renaissance* has become a burning social issue. Our views on the general and professional culture of our people, and on the results achieved in different developing countries (independent of what political orientations they have), are being reviewed.

We are not satisfied with the situation regarding the professional training of workers. The gap between sophisticated technology in industry and the level of worker's qualifications is widening. That's why we can speak about technological crisis. Workers are incapable of mastering modern technology due to the low qualifications they possess. This is the legacy of our extensive-oriented economy [investing in new plants with the old technology rather than providing new technology for existing plants), which knew nothing but direction from the center, as well as our slow transition to a civilized market.

We are preparing some projects: draft USSR laws for vocational education and a state program for placing graduates in the workforce. It is important that we use the experiences of countries with market economies.

Our goal is to make the system of professional education in our country compatible for integration into the world's telecommunication education networks and information systems, as well as manual recognition of education documents.

No doubt we shall continue to progress toward a solution for these problems in our country. Our progress will depend on the pace of democratization reforms and a wide spectrum of national and regional traditions and particular features.

Dr. Igor Smirnov, Vice Chairman
USSR State Committee on Public Education
Moscow, USSR

# Conception of Kazan Community College

Mirza I. Makhmoutov

Our nation—the most vast in the world, uniquely rich in minerals, possessing enormous intellectual potential and powerful industry, and the first to conquer the cosmic space—has reached the stage of severe crisis. The ideas of socialism and communism, with their principles of people's equality, have failed. The faults in philosophy, politics, ideology, societal organization, and government have caused the entire crisis.

Socialism has not survived, regardless of the fact that many people, not only communists, considered it to be the model of social justice, the realization of the social justice concept.

Currently, living conditions for the majority of the population are severe. We couldn't have approached the market over the past 6 years. I suppose it was because of the incompetence of our managers. Our leaders, as people say, were not even able to organize the coup in a clever way.

Today, we all realize that our future is in democratization, conversion to a market economy, and privatization of state property, including both services and industry/agriculture. But privatization alone would not have an effect if the improvement of the quality of consumer goods and the reduction of prices were not taken into consideration as well.

To achieve these goals, we need highly qualified workers and competent managers.

In converting to a market economy, we will be hindered by the stereotypes in our thinking regarding strategies and tactics. For example, in speaking of our nation's economic power, we used to indicate the quantitative factor: millions of tons of steel, oil, cement, cotton; hundreds of thousands of tractors, combines, etc.

What about the Americans? They indicate the qualitative factor. My colleague Dick Anderson, president of Waukesha County Technical College, remarked that for the Americans, the major indices are the market capacity, the technological advancements, the per capita income, the professional competence of the workforce, and the manager's competence.

We will fail if the economic thinking of our managers isn't enriched with new categories of economic evaluation.

The ancient Greeks used to say, "Comparison is the mother of knowledge." In comparison with the United States, we have three times fewer highly qualified workers but three times more low-qualified ones. That's why the productivity in the USSR is three times lower than

that in the United States. For instance, in our automobile industry, one worker produces 5-6 cars a year; an American worker, 12-13; a Japanese worker, 35-40.

The quantitative categories have been the main focus in addressing problems of worker training. Highly centralized planning has created a situation in which large numbers of workers train in some occupations, whereas there is a lack of workers in others.

## Current Training System

Where are workers and mid-level specialists prepared in the USSR, and who is responsible for the preparation? We have the following training system:

- **Professional education and vocational training**—Workers are prepared in 3-year programs at our more than 7,000 *vocational schools*, which enroll 3.5 million students.
- **System of secondary specialized education**—Technicians are prepared in 4-year programs at our more than 4,500 *technicums*, which enroll 4 million students, beginning at age 15.
- **System of higher education**—Specialists are prepared and earn university diplomas at our more than 900 *institutes*, which enroll 5 million students.

The USSR prepared four times as many engineers as did the United States. But what about their productivity? Why can't the workforce training system contribute to economic development, especially when converting to a market economy?

The reasons are numerous: centralized control of educational institutions, the branch principle of professional school organization, old curricula and programs, conservative instructional methods, and low prestige of working occupations and professional schools caused by the absence of an economic base as well as by low salaries.

## Strategies for Reform

What are the ways for reforming the system for training workers and specialists? The strategies are multi-directional, comprising (1) decentralization of professional education and (2) establishment of new types of educational institutions: technical lyceums (based on the existing professional schools) and technical colleges (based on the existing technicums). The idea of continuous education and democratization by step-by-step instruction is being implemented.

Can we say that we have found the new type of educational institutions needed to meet the market needs? Our investigations reveal that it won't suffice. The ***branch*** principle governing the organization of educational institutions limits (in relation to option, location, etc.) the opportunities for people to get professionally educated.

The investigations also revealed that there exist some laws in professional education development that one should, by all means, consider. For instance, our investigations revealed a tendency for the functions of the two types of professional schools—schools for worker training and schools for mid-level specialist training—to be integrated. Formerly, more than 50 percent of technicum graduates joined industry, and the more successful graduates became masters and team leaders. With the appearance of lyceums and colleges, this tendency increased; now mid-level specialists will be prepared in lyceums, and workers will be prepared in technical colleges.

This is why the integration of the functions of workers and specialists is one of the underpinning trends. In addition, one more interesting phenomenon occurs in world practice. I dare say, it is also interesting to our American colleagues. Once, I complained to my friend Chuck Spens, president of Jacksonville College, that we lagged behind the United States in the technical aspect and that we would never be able to catch up in this area. I received a short answer: "You may jump."

I doubt if we can jump, but in any case, we have to look forward. What is the status of the worker and mid-level specialist currently? Their functions vary, but sometimes specialists must fill workers' jobs and vice versa. For example, approximately 2 million engineers occupy workers' positions. The rapid change and increasing complexity of techniques and technology require that workers and specialists receive high-level vocational training.

Thus, the tendency to integrate the functions of worker and specialist has two aspects: (1) the integration of labor and management roles and (2) the integration of labor and organizational/financial functions through development of European and American companies and firms. The reform content at the Swedish electrotechnical enterprise, *ACEA BROWN BOVERN*, which was called the "second industrial revolution," may be explained as Arto Humberg put it:

> In our enterprise there's no difference between a worker and specialist. The specialist roles are performed by workers, and specialists must have a detailed idea of industrial process and participate in it actively. All of them are called *associates* (*Izvestia*, August 15, 1991).

A major role analysis of workers and the swiftly changing demands on them revealed that the most suitable type of vocational education institutions within the democratic trends and market relations appeared to be the American community college. This educational organization makes possible the training and education not only of workers in all occupations but also of all citizens in the community. Not limited but multi-profile vocational schools have the future.

Considering this fact, we began to develop a community college structure approaching that of the American community college. This task will be accomplished using the experiences of the American community colleges in Jacksonville, St. Louis, and Waukesha.

During this symposium, I'd like to discuss the possible variant of such colleges that we have begun to organize in Kazan, and also in Nizhnekamsk.

## Three-Stage Training at Kazan College

All Kazan vocational schools are organized according to the branch principle and linked with basic enterprises. The 4-year summer lyceum, 3-year vocational school, and general secondary school with technical emphasis in senior classes are sponsored by the Kazan Aviation Motor-Building Enterprise. Combining these three educational institutions may create a good educational establishment similar to the community college model. Step-by-step preparation for the opening and for introducing the new curricula and programs are planned.

### College Establishment Goals

Establishment in the USSR of a new type of professional education institution is encouraged by conversion from the ***branch*** principle of educational institution functioning to the ***regional branch*** principle. Institutional reform is implemented through management decentralization, integration and differentiation, and democratization, as well as through humanization. The community college is established as—

- the basic educational institution for the perestroika [restructuring] of the total Soviet professional education system;

- a means for (1) conversion to market economics, (2) enhancement of consumer goods' compatibility, (3) alleviation of the adverse effects of introducing a market economy, and (4) development of small-business enterprises;
- the continuous education model and the means of general vocational training for skilled workers and mid-level specialists and professional level upgrading for the community population;
- a factor in (1) the social protection of youth and adults from total unemployment, (2) people's psychological preparation for a market economy, and (3) specialists' retraining; and
- an experimental base for the American community college educational experience and application of new educational and informational technologies.

## Community College Goals

- Training to provide middle-level managers and junior engineers with a high level of professional and technical management competence
- Training to produce highly qualified workers and specialists for various regional production spheres
- Permanent retraining of workers, engineers, and the unemployed
- General and vocational training for the total population of the community in accordance with their needs
- Conditions that support vocational training of specialists in the native Tatar language

## Objectives

- To provide workers and specialists with high-level skills in the machine-building industry, small business, and services based on the new pedagogical technologies and curricula; and to provide workers with diplomas representing international standards
- To democratize the educational establishment (e.g., providing students with the opportunity to choose a profession according to their inclinations, home learning)
- To utilize American vocational training experience as the basis for technologically advanced labor curricula, programs, textbooks, and instructional materials

- To provide students with broad computerized and humanitarian training using special programs and providing instruction in Russian, Tatar, Turkish, and English (different groups in various occupations)
- To provide the total community with continuing professional education through modern American instructional technologies and college graduates' training within a reduced learning period at a higher instructional level

## The College Structure

As mentioned previously, the community college will combine three existing educational institutions, and new centers will be opened:

- The technical lyceum, with a multi-profile curriculum similar to an American community college curricula and with training for three levels of students as a base for continuing education

  The lyceum trains mid-level specialists for the motor-building enterprise and technicians and junior engineers for other production units (in accordance with their needs). On the first level, the highly skilled workers (qualification level 4) may also be trained. The learning period after the ninth grade is 3-5 years (3-year program for gaining first jobs, 4-year program for technicians, 5-year program for junior engineer staff; after the eleventh grade, 3.5 years).

- The vocational school, specializing in step-by-step training and retraining of metal workers (qualification levels 2-3) for the motor-building enterprise

  The vocational school prepares students for employment and for continuing education at the lyceum. The learning period after the ninth grade is 1-3 years. Service staff training, with a learning period from 1 month up to 2 years, is also available.

- Three-language comprehensive technological school (Grades 8-11), with initial vocational training

  The school trains students for continuing their education in a vocational school or lyceum and for higher education. The learning period is 2-4 years. A certificate is awarded after the ninth and eleventh grades.

- Department for students with secondary education certificates based on higher education programs (first 2 years), regardless of age and occupation
- Continuing Education Center for college staff and enterprise engineers and technicians

- Commercial Center with small businesses capable of working on their own resources due to conversion and consumer goods and machine-details co-production with Americans in accordance with the enterprises' orders; major workers are college students
- Technical Literature Translators Training Center (English, Russian, Tatar, and Turkish languages)
- Information Technologies Center
- Instructional Publishing Center
- Psychological and Social Services Center

The USSR Academy of Pedagogical Sciences Research Institute units (scientific divisions) constitute a part of the college structure for its scientific technical provision, for investigating the problems of vocational education in Tatarstan (pedagogics, psychology, educational economics, vocational orientation, etc.), and for involving practitioners in research activities. The faculty of higher education will participate.

## Step-by-Step Training

The idea of continuing education is realized in college by means of a step-by-step training organization. This means that the entire 5-year study period is divided into three stages:

- Qualified worker training : 3 years
- Technical training: 1 year
- Preparation of junior engineers: 1 year

But in some campuses, another kind of step-by-step training may occur. For example, in vocational school, those who are motivated may graduate in 1 year with a worker qualification in a simple occupation. In 2 years, they may earn a certificate for the second qualification level. In 3 years, they are prepared to graduate with a worker diploma.

Step-by-step training is the most democratic form of education, because it makes it possible for the student to choose a desired occupation, the amount of time the program will take to complete, as well as the routes to further education. It allows for the differentiation of training content according to students' actual abilities—advising them either to start a working career or to continue studying. The faculty is thus given the opportunity to select students according to their abilities, which earlier was prohibited. Such selection is

necessary for further training at the upper stages and in order to prepare capable and motivated students for higher education.

## Technical Base Characteristics

Kazan Community College is established on the technical base of the incorporated educational establishments. For example, the technical college has sufficient facilities to meet the college's needs.

The labs/shops and equipment are being continually improved. We have new buildings for the dormitory and cafeterias. Of course, we need new machinery and computers, but we can't have everything. As they say, "Moscow has not been constructed in a moment."

## The Major Occupations List

It is impossible to give a complete list of occupations, which will be continually expanded, but the following will be part of the initial offerings:

**Workers with Qualification Level 2-3:**

- Turners
- Fitters
- Milling Machine Operators
- Planers
- Construction Workers

**Workers with Qualification Level 4**

- Wide-Profile Machine Operators
- Adjusters
- Numerical-Program Machine Operators
- Computer Machinery Operators

**Specialists**

- Technico-Technologists
- Programming Technicians
- Managers
- Economists
- Mechanics

**Junior Engineers in Basic Occupations of Aircraft, Finance, Energetics Institutes**

- Metal Cutting
- Electrical Equipment
- Electronics
- Economics

**Businessmen**

- Small-Business Development
- Joint-Venture Development
- Trade Staff

**Major Service Occupations**

- Translators
- Municipal Service Workers
- Account Clerks
- Bookkeepers
- Nurses
- Tatar-Language Teachers for the Junior Grades in Russian Schools

## Student Enrollments

The annual college entry is approximately 700-800 full-time students (including 400 students training as workers, 200 training as specialists, and 200 training as service workers) and 1,500-2,000 part-time students.

The continuing education system may serve up to 5,000 students, including up to 50 percent workers and engineers from the motor-building enterprise. In 1993, the system is expected to enroll 2,100-2,300 full-time students and 4,000-5,000 part-time students. The total enrollment would increase to 6,000-7,000 students.

The secondary school should graduate 120-140 ninth and eleventh form students annually (40 to the vocational school, 60 to the lyceum, and 20 to higher education). After the first, second, and third courses in the vocational school, 240-260 students should graduate (160 to basic enterprise, 60 to the lyceum, and 20 to technicums and higher education). After the third, fourth, and fifth courses in the lyceum, 180 students should graduate and enter basic enterprises (including 50 workers and 100 specialists) and 60 should go on to higher education).

On the whole, up to 400-600 students may be sent to industry annually, and 250-280 students may continue their education. Up to 3,000-3,500 students may improve their qualifications and be retrained. These figures are approximations, which may be reduced or increased.

## Teaching/Learning Process Contents in College

The most significant aspect of the training provided for workers and specialists in the community college is the reform of the instructional content on the basis of humanization, integration, differentiation, informatics [information technology], problem-solving activities, etc.

Closely correlating general and vocational subjects and correlating both with industrial training and shop/lab experiences will serve as a basis for the knowledge system and will integrate personality formation, characterized by a high level of competence. Up-to-date knowledge both in the natural sciences and the field of technics and technologies should be an optional feature of the instructional content.

The humanization of the course of study should be reflected by including in the structure of vocational subjects not only such disciplines as history, the history of technics, the history of the arts, the history of civilization, but also the elements of humanitarian knowledge.

## College Curricula

The college curricula are based not on the existing curricula improvement but on a scientifically based calculation of study time per day, week, and year. The modern

vocational education concept in the new type of educational establishments is being implemented in reference to the college curriculum and the principle of optional content, and its combinations are formulated in curricula and programs.

The subjects in the curriculum are traditionally distributed by cycles: general, general-technical and general-occupational, special. In each cycle, an alternative group of subjects is suggested, optional subjects are listed, and subjects for in-depth study and facultatives are noted. The principles of step-by-step study, cohesion, and integration are necessarily reflected in the curriculum.

The number of hours per subject is determined by the amount of knowledge and skills included, as determined by the qualification standards established for a worker or specialist. The time per week could be 36 hours, but this may vary according to the situation.

The total number of study hours at present is 4,470, including—

- 21-40 hours for Grades 8 and 9
- 23-30 hours for Grades 10 and 11
- 42-90 hours for vocational school, plus 1,920 hours for the general course, 360 hours for the general-technical course, and 2,300 hours for the vocational course
- 4,630 hours for the lyceum, including 2,270 hours for the general course, and 2,350 for the general-technical course
- 5,600 hours for college, although this figure may reach 6,000 hours

The correlation of general and vocational disciplines, as well as the problem of theory and practice, is dealt with by the College Experts Council. The major problems in investigating the procedures for establishing the curricula relate to training workers and specialists for various qualification levels.

## Programs, Subjects, and Courses

The programs are formed based on an analysis of college graduate qualifications, characteristics, subject context, and curriculum framework. They are flexible, giving staff the option of changing the syllabus structure—introducing new information and removing old information, depending on students' actual characteristics, the group instruction level, the occupational specialty, technical aids, etc.

The programs' quality is assessed during instruction by the scholars using formative testing, and the quality is evaluated by an expert group consisting of the related college staff and representatives of the enterprises.

## Teaching/Learning Process

The teaching/learning process in college demands that reform is first rooted in the aims of the organization. Naturally, the acquisition of scientific and technical knowledge remains the major purpose of study. But the formation of intellectual and practical competence should be the focus of the teaching/learning process.

The intellectualization of labor and industrial processes has already challenged the task of staff training. Staff must be capable not only of performing their duties exactly but also of independently solving the industrial and technical-technological problems appearing in people's interactions in the technological process. This is why the major emphasis in the teaching/learning process is upon the development of students' thinking skills as an important socio-economic reserve of the scientific-technological process rather than on the scientific-technical process itself.

Hence, the new pedagogical technologies—appearing as a result of traditional problem-solving instruction and the development of computer-aided learning and technical aids, new informational means of communication, and relations between teachers and students—should be introduced into the teaching/learning process.

## What Are Psychologists Debating About?

There is no need to prove that all instruction today should be organized according to an intellectual development model of teaching. The intellectual potential of any state is a main resource for its economic and social progress. The scientists of the entire world search for possible ways to solve that problem, and very often their approaches happen not be identical.

It is known that a teacher may teach creative thinking only if he himself can think creatively. Consequently, he himself should be educated. First, it is necessary to explain what are the psychological laws of active, productive, and creative thinking. Only on the basis of more or less proper knowledge of these laws is the setting of didactic methods and means possible.

There are two controversial viewpoints in Soviet psychology concerning the nature of *thought*. Some scholars (e.g., S. L. Rubinstein, L. S. Vigotsky, A. M. Matiushkin) state that there may be different levels of thought: reproductive and productive. Productive thought is, in turn, divided into analytical and heuristic (or creative) thought. Other scholars (e.g., A.V. Brushlinksy) think it is impossible to talk of levels of thinking. They contend that if an individual thinks, he always thinks creatively.

In American psychology, the levels of human thought are considered types of thinking. Critical and creative thinking are examined separately. But sometimes, all types of thinking are considered to be similar: problem-solving, creative, critical.

John Dewey was the first to put forward the idea of specifically teaching children to think creatively by means of problem-solving instructional approaches. The book *How Do We Think* appeared to be the beginning of the development of problem-solving teaching/learning. The English psychologist Edward de Bono distinguished six styles of thinking, each designated by its own color. Respectively, the different means of intellectual formation are suggested. The German scholars, who themselves introduced the phenomenon of the problem situation at the end of the last century, worked out an entire system of intellectual training methods using material from various subjects.

I've been dealing with problems related to problem-solving teaching/learning for more than 20 years. Several books have been released, some of which have been translated into different languages: Spanish, Chinese, etc. Unfortunately, there are no English translations.

To my mind, there is currently an opportunity to combine Soviet and American approaches to interpreting levels of intellectual activity. Let me demonstrate these levels to you with the help of some problems on which the thinking is directed.

***Puzzle 1***

*A flock of geese flew across the sky. Another goose approached them, greeting them in the following manner: "Hello, one hundred geese." "No," they answered, "we are not one hundred geese. When we are twice as much, half as much, a quarter as much, plus you, the goose, then we are one hundred geese."*

The question is, how many geese were there in the flock? How is this problem solved? Mentally calculating the various figures, one discovers that there were 36 geese in the flock ($2x + \frac{1}{2}x + \frac{1}{4}x + 1 = 100$). What kind of thinking is it? Certainly a reproductive one, because we have no discovery; the individual acquires no new knowledge.

***Puzzle 2***

*An old man approached the river. He had three possessions with him: a wolf, a goat, and a cabbage. The boat could only take one of them at a time. How should he transport them to the other side of the river? If he took the wolf first, the goat would eat the cabbage. But if he took the cabbage first, then the wolf would eat the goat. The old man decided to take the goat first, because wolves don't eat cabbage. When he got back from taking the goat across, again the question arose. If he took the cabbage to the other side next, the goat would eat it when he returned for the wolf. If he took the wolf next and returned for the cabbage, the wolf would eat the goat.*

Here is a problem situation. To solve the problem, it is necessary to speculate: The old man takes the cabbage on the second trip, returns the goat to the original shore and leaves it there, and takes the wolf on board. Here we witness an example of combined reproductive/productive thinking.

***Puzzle 3***

*Two men approached the river and asked the boatkeeper for a boat. "Take it," he answered, " but the boat will only hold one person. And you must return it."*

Here is another problem situation. This problem doesn't require a decision; it requires guesswork to divine a possible solution. If the two men approached the river from opposite shores, the puzzle is immediately solved. Here we witness pure insight—guesswork without analysis.

Having once explained the nature of thought, we can apply the modes and methods of problem-solving teaching/learning organization to material involving mathematical, physical, and historic problems. Taking these psychological laws into account, I have shaped a system of instructional methods to explain what the term *psycho-pedagogical* means. Thus, on the basis of the Soviet approach, we can single out three types of thinking:

- Reproductive (rote memory)
- Analytical (logical analysis and synthesis)
- Heuristic/Creative (logic, insight, guessing)

Edward de Bono's six styles of thinking are well known to American educators:

- Reproductive (white hat): Data information
- Emotional (red hat): Emotional perception, absence of logical analysis

- Critical (black hat): Logical analysis of negative aspects of a problem
- Constructive (yellow hat): Logical analysis of positive aspects of a problem
- Lateral (green hat): Analysis, logic, guesswork, alternative decisions
- Conceptual (blue hat): Generalization, creativity

It is known that the modes of learning and the styles of thinking often coincide: perception, analysis, generalization, concrete definition, comparison, etc. Cannot all these modes of different types of thinking be synthesized and then expressed in terms of pedagogical modes and methods of teaching? In that case, the teacher would get a methodic means for guiding the cognitive activity of the pupils and forming their intellectual skills. Isn't it possible to include new knowledge about the nature of thought within our previous system of methods?

During our first symposium in Anapa, I made an attempt to demonstrate the types of problem-solving teaching/learning as a combination of definite instructional forms and methods. My further research revealed that they could constitute a basis for the development of differently functioning educational techniques. The following basic nomenclature of methods has been established:

- Monologic [monologue-type]
- Illustrative/Demonstrative
- Dialogic [dialogue-type]
- Heuristic
- Investigative
- Programme
- Algorithmic

These methods have a binary nature (i.e., interaction of two processes—teaching and learning):

- Informational
- Explanatory
- Instructive
- Stimulating
- Motivating

- Executive
- Reproductive
- Practical
- Semi-searching
- Searching

All the above-mentioned methods reflect different variants in teacher-student interaction, each of whom utilizes his own methods and means. If the teacher provides some information about regulations (rules), demonstrates certain articles (items), explains the essence of the matter, asks questions—which of the methods could we speak of?

If explanation dominates (i.e., distinguish the analysis of facts, their comparison, generalization, etc.), then we can speak of the explanatory method of instruction. If the meaning of the facts isn't explained—if only bare facts are given—we can speak of the informational method of instruction. If the students are listening, making observations, and memorizing, we can speak of the reproductive method.

If the teacher is mainly asking problem-solving questions and isn't explaining anything—is just directing the students' cognitive activities—we can speak of the motivating method. If students are working as researchers (i.e., they independently state a problem, frame hypotheses, prove their hypotheses or guess how to solve the problem by independent analysis of facts), we can speak of problem-solving teaching/learning.

What will be the level of thinking in the above-mentioned teaching/learning methods? Both the executive and the reproductive methods speak for themselves: the reproductive thinking is taking place here.

Problem situations may frequently occur in student activities. The students should be thinking more actively. We might call this an analytical or heuristic approach; or according to de Bono, we might call this thinking from an emotional to a conceptual level. It all depends upon the nature of the facts the student meets in his practice activities.

The semi-searching and searching teaching/learning methods also reflect five thinking styles according to de Bono. They reflect conception or analytical and heuristic thinking styles according to Rubinstein. In every particular case, it all depends upon the complexity of information received, the students' skills, and the teacher's techniques. The material may be either critically analyzed, leading to alternative questions, or there may appear an insight, in which case, we would solve the problem with the help of creative thinking.

The teacher can't implement only a single instructional method; for example, solely investigative or algorithmic. The teaching/learning process will have an effect only when various methods are combined. But what combination of teaching/learning methods will the teacher prefer in various pedagogical situations? It depends upon the teacher's learning experiences and his pedagogical intuition. But being a professional, he should know the guiding principles.

The research revealed that there exist typical pedagogical situations in which, given a definite structure of instructional content, we always witness the combination of the same teaching/learning methods. On this basis, we tried to single out several pedagogical techniques designed to improve students' thinking skills. We'd like to identify these techniques:

- Problem-Dialogic (dialogue, conversation)
- Problem-Task (solving of cognitive tasks)
- Problem-Model (games, model performances)
- Problem-Computer
- Problem-Context (modeling the subject and social content of professional activities)
- Problem-Modular (integration of problem-solving content into the instructional program methods)

All these techniques are specifically designated as *problem* because they could be simply informational, not used to improve students' thinking abilities.

I hope we'll succeed in debating these paradigms for solving the emerging questions and in designing exact recommendations for educators to use in their practice.

## Financing

The major resources are the federal budget, a grant from the enterprises, tuition fees (on orders), college production and commercial activities, and grants from sponsors. The major resources required to open a college and provide for its basic expenditures must be defined based on the following:

- Faculty and administration salaries in the college (in roubles in the USSR and in dollars in the U.S.)
- Provision of technological equipment and educational technical aids (computers, laptops, telecommunication equipment)

- Translation of American materials and documentation into Russian
- Printing of learning and instructional materials (in roubles and dollars)
- Organization of retraining courses for faculty and instructors in the USSR and U.S. (both in dollars and in roubles)
- Provision of opportunities for specialists, students, and faculty to visit the USSR and U.S. (both in dollars and roubles), etc.

## College Management

The college is governed democratically by the College Council, with the General Director or the President or the College Council chairman as its head. His areas of responsibility include organizational procedures, material-technical supplies, staff placements, financing, and interrelations with industry.

The campuses and self-financing centers function according to the common plan. Each campus director's responsibilities focus mainly on the teaching/learning process and the provision of graduate training. All directors maintain relations with industrial enterprises, which are represented in College Councils and campus faculty councils. The Advisory Committee, assigned by the Republic Government, carries out the external governance. The Centers' directors are under the authority of the College President and work independently on a self-financing basis.

## American Counterpart Participation

The experimental activities are being carried out in accordance with the American Association message of April 30, 1990, and under the agreement between the Center on Education and Training for Employment (CETE) at The Ohio State University in Columbus, Ohio, and the Research Institute of Secondary Special Education of the USSR Academy of Pedagogical Sciences.

Florida Community College at Jacksonville, Waukesha County Technical College (Wisconsin), St. Louis Community College (Missouri), and the others, as well as CETE, provide technical assistance to the Tartar college by—

- Supplying the college with their programs and textbooks (in English) for managers and motor-building and small-business staff training

- Exchanging instructions for temporary provision
- Helping to equip the college classrooms with computers and other technical aids
- Cooperating in carrying out research concerning the training of managers, mid-level specialists, and highly skilled workers
- Publishing—in cooperation with the Research Institute—teaching materials and college papers in Russian and English, with the participation of the faculty and students of the Soviet and American partner colleges

Everything that I have set forth doesn't have a claim on truth. It will require additional testing. Experimental simultaneous training and joint publication in the American and Soviet colleges will allow us, I am inclined to think, to more objectively evaluate the results of our joint research and cooperation.

# Complex Didactic Subject Support

Dilyara Shakirova

For what reasons is it necessary to reconsider the approach to identifying educational content in our country today?

1. There is a shift in ideology taking place in our country. A demand to produce specialists—capable of thinking independently, critically, alternatively—is being introduced.

2. The economic structure of society is changing rapidly and new elements are being introduced: flexible, competitive enterprises with a demand for trained specialists possessing a wide spectrum of knowledge in various areas and concrete applied skills.

3. International relations in economics, life-style, culture, and education are developing and expanding. This necessitates the internationalization of content.

4. A major shift in techniques and technology is taking place, which gives rise to changes in the rate at which knowledge must be renewed, and changes in the ways in which knowledge is stored, retrieved, and processed.

New information technologies alone, and attempts to introduce them into the existing educational system, highlight all the system's drawbacks and conservatism. I'd like to focus on the idea that educational technology transforms, from the inside, the existing teaching/learning process. The contradiction between the content of a major part of the subjects and the new educational goals becomes quite evident.

Two approaches traditionally exist in education. The **first** considers education as a process of supplying knowledge and social experience, the mastering of which makes it possible to teach creative thinking and decision making. The **second** relates education to the active and creative mastering of knowledge, providing personal experience in solving problems and developing the ability to think creatively.

Analysis shows that the content of textbooks on math and science subjects is based on the first approach; i.e., on the principles of hystorism [historical awareness], progression from simple to complex or from specific to general and then back to specific again. Even the integrated courses are based essentially on these principles.

These bases can be used successfully in the first three stages of education, as well as in those situations in which the textbook is the only source of knowledge. However, the functions of the textbook undergo considerable changes when various instructional means (textbooks, computer programs, video, labs, knowledge bases) are used in combination. All this causes a contradiction between educational goals: use of active methods and forms of teaching/learning versus presenting content based essentially on facts.

Day-to-day life presents new problems and tasks demanding new methods of solution. They must be integrated into the specific subject's content, and students must be provided with the skill to apply the acquired knowledge. All this also imposes definite demands on the subject matter itself.

The approach demands integrity and interdependence in the development of teaching/learning content and processes. All instructional materials must be based on similar principles and a single technology. Optimal results can be achieved through a definite distribution of the functions of each instructional method, period, and form of its use.

## Major Trends

What are the major trends in reconsidering the educational content in technical education institutions?

1. **FUNDAMENTALIZATION of technical education**

   There are a great number of new occupations, disciplines, and courses emerging today. However, in our viewpoint, another approach, based on integrating new knowledge into traditional courses, is also quite likely. For example, introducing the elements of chemical cybernetics, biotechnology, and modeling of processes into chemistry courses for technologists.

2. **HUMANIZATION of technical education**

   Humanization can be displayed in different ways. One of them is to fill the science and math and professional disciplines with methodological content.

3. **Principle of NOOSPHERE**

   The noosphere is the sphere of interrelations between humans and nature, including the earth and space. This principle takes into consideration not only ecological knowledge but also the formation of active professionalism. The latter means

mastering skills that make it possible to balance the professional and technological demands of production with the necessity of protecting nature.

4. **Demand for training of TECHNICIANS WITH DOUBLE COMPETENCE, combining technical education with management skills**

   This problem is often solved by the development of new occupations or courses. It can also be solved within the traditional courses by integrating specific methods of science and management into the content and corresponding educational process (use of heuristic methodological elements: brainstorming, business games, simulation of the professional environment, etc.).

5. **One more important problem**

   Analysis shows that programs and textbooks reflect the level of technology development and the scientific methods of past years. Even the synthesis modes moved from one textbook to another during the last 20 years. There is no agreement in terminology, symbols, or graphic and material presentation styles in Soviet and foreign textbooks. It's clear that each nation's educational system has its own peculiarities. At the same time, the processes of integration and internationalization make a great impact on all the components of the educational system and must be reflected in the educational content.

How can all the above-mentioned trends be taken into account? It is possible if an integral, homogeneous cluster of content and technology is developed for a specific occupation. The **first** factor is the special technology for developing the curricula. We propose a computerized system of curriculum development, which optimizes the content of the cluster (Figure 1). The optimization criteria are as follows:

- Extent to which the knowledge, skills, and competencies included in the industrial training program correspond to the qualification list. The desired level of correspondence is 75 percent.
- Determination of interdisciplinary links (parallel, previous, and prospective) between industrial training and professional and general disciplines.

The **second** factor is the general technology of designing the subjects' content and instructional methods. The technology incorporates three factors: content, teaching/learning methods and forms, and assessment of the materials developed.

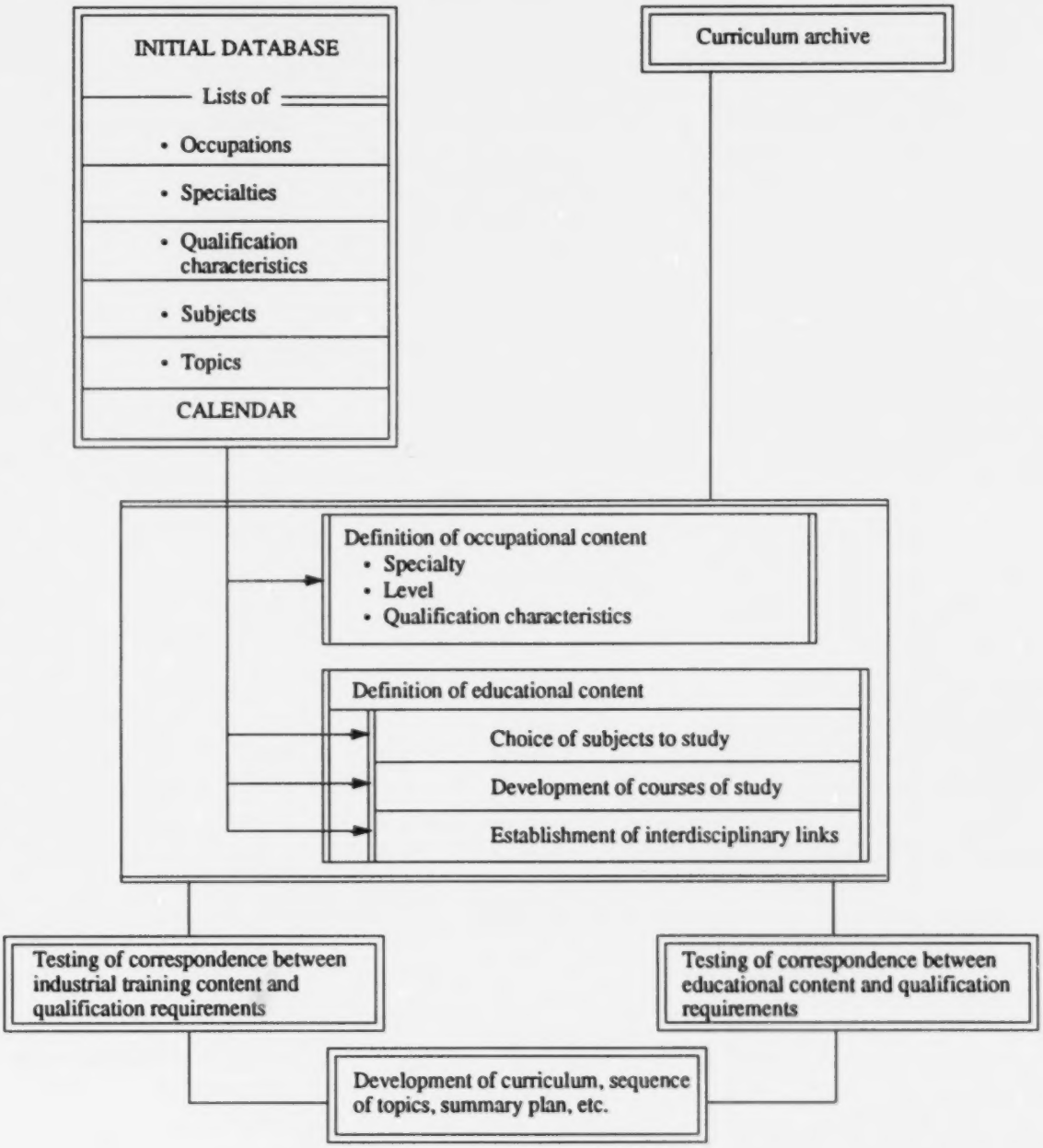


**Figure 1. Program of curriculum development for the establishment of professional education**

## Essence of a Given Technology

The essence of a given technology includes seven stages:

- **Stage One:** Determination of different levels of goals for specific occupations, cycle of subjects, subject, theme
- **Stage Two:** Determination of competency level requirements for the cluster of occupations, subject area, type of program
- **Stage Three:** Choice of instructional materials (textbook, software, etc.) at different content levels: instructional program, part, theme, specific computer program
- **Stage Four:** Structuring of content

  Structuring determines the nature of the learning activities and the forms of teaching/learning. In addition, it establishes the different technical means and physical-chemical equipment requirements and all the peculiarities of the teaching/learning process.
- **Stage Five:** Programming or designing of the technology, including the choice of computer language, version, the plot development, coding, adjusting, and specification

  In general, it is a stage of didactic material development.
- **Stage Six:** Development of the teaching/learning technology through computerization
- **Stage Seven:** Evaluation of the didactic materials: pedagogical software quality and efficiency (Figure 2)

  Our system is based on expert evaluation of the elaborated programs in terms of both system-and-technical and psychological-pedagogical quality parameters. The results provide an opportunity to make program changes before actual use. That means approximating the real object using a model.

  The experts represent two groups: programmers and teachers. Correlation analysis provided an opportunity to align the parameters of quality identified by both groups: determination of goals, ways of transferring information, adaptivity. Part of the parameters differ in level between the two groups of experts, however.

| | |
|---|---|
| **STAGE 1** | Determination of aims on different levels |
| **STAGE 2** | Determination of competency level requirements with regard to specialization |
| **STAGE 3** | Choice of learning material for software content |
| **STAGE 4** | Content structuring |
| **STAGE 5** | Programming |
| **STAGE 6** | Elaboration of computer-assisted instructional technology |
| **STAGE 7** | Evaluation of the quality and efficiency of pedagogical software |

**Figure 2. Technology of projecting pedagogical software**

## Use of Approach in Developing the Content of Chemistry

Chemical education is within the scope of our interests, so we attempted to determine the attitudes toward chemistry of students in various occupations and simultaneously to identify the most suitable information for improving their perceptions. Almost 85 percent of the students questioned placed chemistry third or fourth (i.e., in the middle or next-to-last place). The relevance of chemistry was rated as 3 or 2; however, only 11 percent chose the occupation of chemist-technologist. Those who had chosen an occupation relating to chemistry had more positive perceptions concerning the descriptive material.

In fact, an individual chooses the kind of information consistent with his genetically defined thinking. This very information gives him emotional pleasure. However, creativity is hard work, demanding different thinking styles; otherwise, the specialist is narrow-minded, incapable of creativity.

To end or reduce the negative emotions caused by unsuitable information is the task of content designers and faculty. But we teach chemistry in a similar manner to both the technically minded and those in the humanities. At the same time, the learning discipline is formally logical, unlike real science.

Chemistry, chemical technology, physics, etc., should differ in the logic and form in which material is explained. For the **technically minded**, it should start with strictly logical and structured material and then move to the imaginative and emotional. For **those in the humanities,** it should start with the imaginative and descriptive, with reference to the history of science, and move to the strictly logical, structured with graphic and numeric information.

Let's focus on the content of chemistry being taught according to information technology. The material must be presented as a system and include several blocks (Figure 3). The sequence of blocks, the connections between them, and the time distribution should depend on the specific occupation and should be clear to both teacher and student. The following types of connections are possible:

- Hierarchical ties
- Ties of similar significance

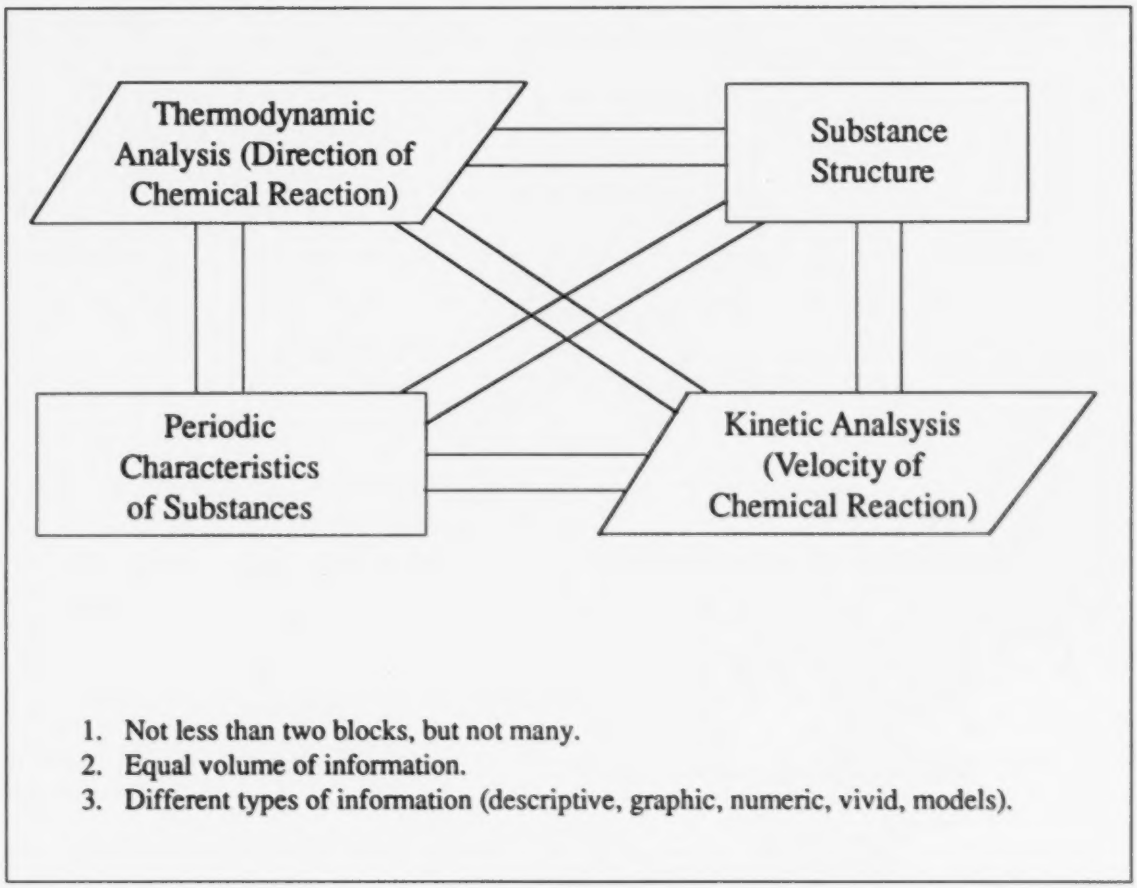
Thermodynamic Analysis (Direction of Chemical Reaction)
Substance Structure
Periodic Characteristics of Substances
Kinetic Analsysis (Velocity of Chemical Reaction)
1. Not less than two blocks, but not many.
2. Equal volume of information.
3. Different types of information (descriptive, graphic, numeric, vivid, models).

**Figure 3. Chemistry-system approach to course**

The first shows the logic of the subject and the logic of scientific analysis of the object. The second identifies material with similar significance that is necessary for studying the given object, reaction, process. With this approach, the selected material should be capable of linking all knowledge blocks. Material lacking this property is ignored. This is the actual way of optimizing the volume of learning material.

The multi-lateral analysis of chemical objects demands the use of certain methods of science and educational technology. The didactic system also has four blocks (Figure 4). Its hierarchy depends on occupational profiles. For example, for specialists dealing with management, the methods relating to social competence are in first place. For workers and technicians, modeling, algorithmization, etc., are in first place.

Superimposing the two presented systems and their application to each element of the whole instructional-technological system will provide, in our viewpoint, optimum results.

## Functions of Each Complex Component

The textbook contains practical, scientific, technological problems, constructed according to a certain logic; and a minimum amount of material, providing the possibility of their solution. All these problems are divided into instructional subproblems at different levels of complexity and generalization. They are, in fact, representative of the stages of logic in a scientific and instructional search for a solution.

The following tools are used to solve these problems: chemical experiment (described in lab practicum), computer programs of various types (databases, investigation, testing, modeling, training, programs of planning experimentation and data processing, etc.), and video and audio means. In addition, we include two more components in this system: computer-supported learning aids and instructional material on using the system.

Pedagogical experimentation in evaluating the efficiency of the described approach is implemented in the instructional environment. The depth of learning mode transfer on the professional activities style would also be assessed. This is the fragile chain in our research, and it requires cooperation with our American colleagues, who have great experience in this area.

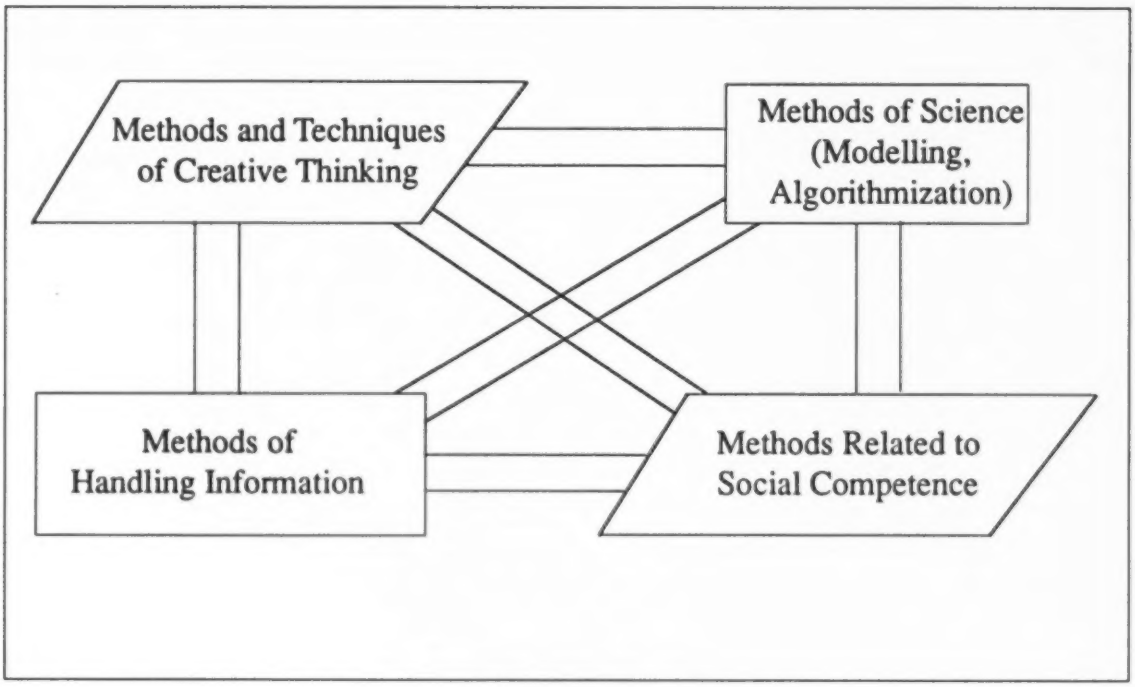
Methods and Techniques of Creative Thinking
Methods of Science (Modelling, Algorithmization)
Methods of Handling Information
Methods Related to Social Competence

**Figure 4. Didactics**

# Strategies of Professional Education and Vocational Training Organizational Structure Development in the USSR and Technically Advanced Nations: Comparative Aspects

Lily I Gurije

Systems of professional education and vocational training vary considerably throughout the world as a result of both economic and national factors. The investigators singled out several patterns of professional education and vocational training based on their common major characteristics, although, strictly speaking, these pattern divisions are rather arbitrary.

These characteristics concern, first, the organizational structure of the system, as well as its place, role, and relationship with external surroundings. Hence, we distinguish the following characteristics:

- Correlation of centralization and decentralization in the system's management and financing
- Role of government and formal system of education
- Participation of societal partners in making decisions for the professional education system
- Correlation of state and private initiatives for efficient training of highly qualified staff to meet national economic needs

Is there any point in studying other nations' learning experiences for possible utilization? This question shouldn't be ignored. In answering this question, many investigators point out the common nature of the overall problems. Actually, regardless of the nature of the system—centralized as in France or decentralized as in the United States—we have a common problem: how to train qualified specialists to meet the needs of modern industry. In the midst of profound technological changes, specialists need to learn to swiftly adapt to these changes and to be able to initiate them.

Our state has just started conversion to a market economy, and it's not yet clear what market it's going to be. We have no idea how long the period of economic stabilization will last or which factors will determine the further development of professional education. On the one hand, the uncertainty causes problems in defining the pattern for a renewed

educational system (the necessity of reform goes without saying). On the other hand, the uncertainty of the transitional period opens up possibilities for the rational utilization of foreign experiences.

The extent of the system's centralization or decentralization serves as one of the major indices in determining the organizational structure's major characteristics and functioning. In highly centralized nations, the government usually defines in what areas the teaching/learning process will take place, whom to teach, and what subjects to teach. The politics require direct execution of the decisions. It's a rather simple and efficient-enough strategy.

But world experience shows that overcentralization at each level has negative consequences. One example is the USSR, where centralization has long been rigid and dogmatic in nature, in combination with planned economics and the state's monopoly in all spheres of life. So here there's an evidently growing gap between the needs of modern industry and the training of qualified staff to meet those needs.

Absolute centralization on the one hand, and the branch system of staff training on the other, have raised a number of problems. Substantial fragmentation was characteristic of the training for mid-level specialists, with its specialization in branches and sub-branches. This resulted in overlap and parallelism. The system was developing extensively, and the integration of technologies was not sufficient.

The strictly hierarchical system, numerous intermediate links, and over-administration have caused the following problems: renewal of staff training was slowing down, and swiftly advancing economic branches lacked qualified staff. Currently, technician training in the USSR is marked by considerable drawbacks: they are not able to operate modern equipment efficiently, their practical skills are not adequate, they have no engineering skills, and they are professionally immobile.

All these drawbacks are caused by the organizational structure of the staff training system and its principles of governance. The specialists training system requires coordination in the areas of training politics, finance, establishment of courses, program content, etc. The systems may be decentralized in one part and centralized in another. We need an optimum balance, providing a more effective staff training process.

The level of centralization varies substantially throughout the advanced nations. The French system is traditionally a highly centralized one: the schools are federally funded, and the programs of study are designed by central bodies (in Paris). But the number of entering students is defined by a separate institution. In addition, short-term, in-firm courses are also

fully decentralized (i.e., the firms decide for themselves whom and what to teach). The government merely controls expenditures for training needs, provided by relevant taxes on payments.

In nations with a market economy, the administration in educational institutions itself determines the number of workers to be trained in accordance with market needs.

As for the USSR, up until recently, instructions dictated student enrollments, which did not depend upon community or production demands. This increased the gap between the number of specialists needed in industry—their specialization profile—and the number who graduated from educational institutions.

In France, the system of professional education and vocational training is subject to major strategies of indicative planning. For this very reason, the Department of Education coordinates its activities with the Planning Council. All regulations and other documents concerning programs, diplomas, and faculty are adopted on a state level and are compulsory for all regions. The regional committees on professional education operate on a local level.

For vocational training to meet economic needs, there exists in France an entire coordination network. The professional advisory commissions, based on a branch principle, play a key role in this respect. They develop recommendations for setting forth the needs for different qualifications. Also, some semi-governmental organizations function to provide more flexible management of various subsystems in professional education.

In cases where education is decentralized or private, the role of the state becomes complicated. With the market economy in mind, the governmental influence is, to a certain extent, damaging, as the market is in a better position to know its own needs. At the same time, the free market suffers from underinvestments in staff training. Thus, the government's function is to pursue its own policy in the staff training process.

Legislation is the most effective tool for this policy. Special programs for the promotion of certain political decisions, with relevant financing, are very popular. A good example is the Western European strategy for training the displaced.

Technically advanced nations finance education differently. Their major common element is the tax on salaries in an enterprise. The firms give 1 to 2 percent of their salary funds for educational purposes. They are free to use this money for in-firm training or for employing commercial firms to conduct these courses. The unused money is placed in a governmental fund for staff training. The benefits of this approach are that it motivates and

stimulates firms to invest money in staff training and that firms are given alternatives in organizing their staff training efforts.

In France, the centralized expenditures are of major significance: 80 to 90 percent of all expenditures pass through the central budget. Priorities in training spheres are determined by redistributing the acquired money: state grants for training in metallurgy, 100 percent; automobile construction, 156 percent; electronics and radio electronics, 198 percent; oil chemistry and oil refining, 372 percent.

In Germany, on the other hand, the expenditures of the Landern and local bodies approach 90.4 percent of the entire state expenditures on professional education. The central government distributes grants for carrying out research, as well as for establishing additional learning sites in the private sector. The central government's expenditures also include tax privileges for big private enterprises possessing their own training centers.

In Germany, the management centralization process is being strengthened. The system of professional education and vocational training in Germany is decentralized, but over the recent period, state control over vocational training has been increased, and state research centers for coordinating and improving professional education have been established.

The state takes special measures in providing training for the displaced, women, handicapped, and ethnic minorities. The state also implements the professional orientation program, including vocational teacher training. Meanwhile, the employers determine the professional education and vocational training strategies.

In the United States, professional education issues are a function of the Department of Health, Education and Welfare and Department of Labor. The major division in the Department of Education is a directorate on professional education. It analyzes federal strategies in professional education areas, makes grants to states and local bodies and controls their expenditures, analyzes educational improvement projects on a local/state level, and provides technical assistance. These constitute a minimum of functions, letting us speak of national strategies in professional education and vocational training areas under decentralization.

In the United States, we see the development of diverse educational institutions in separate states and communities, but professional education at the secondary level is of a specific nature. Further professional education and vocational training is included in the system of further education (colleges). The variety of colleges preparing highly qualified workers, technicians, junior specialists, and engineers-technologists for technologically advancing industry, as well as the numerous community colleges providing communities with a qualified

workforce, constitute a very interesting peculiarity of the American professional education system.

These multi-functional educational institutions are a focus of Soviet educators' attention. They seem to be rather attractive to us under current conditions, when the entire system of professional education is being reoriented to the demands of separate regions, republics, and areas. Decentralization is rapidly gaining force. It's quite possible that central bodies, which would be identified at the end of the restructuring of the educational system, would have functions comparable to, or possibly even more limited than, related U.S. bodies. But such a sharp transition would give rise to new problems. It goes hand in hand with our perestroika. To break the old structures seems nevertheless to be very painful.

The educational experience of Great Britain is of great interest for the USSR because Great Britain is also in a transitional period as far as professional education and vocational training are concerned. Traditionally, Great Britain's system of education differed considerably from ours. The system of professional education and vocational training is so complex, so highly decentralized, that one could hardly speak of general state strategies in this area.

There is no common system of education in Great Britain, and maybe the same is expected in the USSR. England and Wales have similar systems; the systems in Scotland and Northern Ireland differ from the others. In Great Britain, the role of the national authorities was even more limited than in the United States. Up until recently, their role was limited to elaboration of educational strategies development, resource allocation, and control over the educational facilities. National authorities' activities did not include curriculum content elaboration. They did not direct the activities of the schools and colleges, did not form faculties, and did not introduce or approve exams.

Responsibility for organizing the operation and management of primary, secondary, and further education belongs entirely to the local education authorities, which total 150 in the country. They determine the number and the types of schools in their areas, the number of teachers for each institution, and the budget. About half of the budget is funded by the state; the other half is provided by local taxes. According to a 1944 Act, the local authorities were responsible for higher education, governing the polytechnicums and 4-year colleges. Curriculum development was entirely the responsibility of school and college authorities, with control provided by the state on behalf of "Her Majesty's Inspectors," who were responsible for advising and making recommendations to the Department of Education.

The Reformist Act of 1988 substantially changed the arrangements of the educational systems in England and Wales, didn't affect Northern Ireland, and reformed the university activities in Scotland. Essentially, the Act of 1988 concerned the distribution of power, strengthening the power of the State Secretary of the Department of Education and Science and establishing government control over the curriculum. It also introduced some arrangements letting the schools and colleges expand their self-government and independence. Thus, the role of local authorities is now to coordinate the educational institutions' activities rather than to organize the teaching/learning process. The colleges of higher and further education are not supervised by local authorities.

Currently, Great Britain is enduring a transitional period: the role of the old system is limited to certain professional areas. There is no complete evidence concerning who and how they will train the workforce in the 1990s. The branch principle of vocational training management dominates in Great Britain. The upper level of the organizational structure of state management in vocational training is represented by the Department of Education and the Department of Employment.

The major division in the Department of Education and Science is Career Services, with a broad network throughout the country, both on a regional and local level. This division is responsible for the professional orientation and employment of those who are not involved in the educational systems. In addition, this division participates in the implementation of national programs of professional education. The department also deals with curriculum design, full- and part-time curriculum development, and planning of the educational institutions' work in the area of vocational training.

The Department of Employment is responsible for the implementation of national policy on a broad range of issues in the world of work. In the area of vocational training, the Workforce Resources Commission is the executive body. It is responsible for the planning, design, and implementation of national programs; the functioning of vocational training centers, which are under the supervision of local education authorities; and the development of vocational training to meet workforce requirements.

Specialists admit that the British system of professional education and vocational training has not met industrial needs over the last decades. Over-decentralization, privatization, narrow coordination, and the small amount of government control have caused a drop in workforce qualifications. This situation couldn't help but hinder the nation's international competitiveness.

The new strategies imply the establishment of certain centralization elements. Centralization is not accomplished through limiting the educational institutions' self-

government or through administering as with planned economics. Rather, it is done more flexibly (i.e., through regulations concerning levels and training criteria and graduation requirements). The experience of various Examination Councils, which are self-financing and work in close contact with the administration and free enterprises, may be of certain interest to us.

As experience reveals, overcentralization, as well as decentralization, reduces the efficiency of professional education. But including certain decentralization elements would be of substantial benefit. At the same time, assuming diversity in standards (decentralization) in the vocational training of staff may cause its deterioration.

In the USSR, a country with planned economics, key among the providers of professional education and vocational training were public educational institutions. In states with market economies, the public educational system also plays a key role, but there are many other organizational arrangements for providing professional education and vocational training as well.

Let's consider Germany. Germany has the most complex educational structure. Differentiation with professional orientation are the base, laid by the existence of three various types of schools providing general education. The dual system of professional education characteristic of all German-speaking countries is based on on-the-job apprenticeships.

Apprenticeship systems combine on-the-job training with compulsory studies in a relevant vocational school for approximately 10 hours per week. The early differentiation reflected on an organizational level is intensified by the professional education system: in Germany, there exist various secondary vocational schools (up to 12 major types). Serving an auxiliary role in the system of professional education and vocational training, they link the general schools with the apprenticeship systems.

The vocational schools do not award qualification diplomas. They either precede the apprenticeship period (for 1 to 2 years) or constitute a part of it. Depending upon the vocational school, Level 1 may enable a student to acquire a more or less complex occupation. And only after a year of apprenticeship may one take an exam for a working qualification. As a result, 88 to 90 percent of all workers pass the apprenticeship (the others are not awarded qualification diplomas). Meanwhile, more than 20 percent are in the training centers of big enterprises. The advanced-level vocational schools prepare highly qualified workers.

Professional education is also offered by the in-firm training system, but because of high costs, only big firms can afford it. If in the United States and Japan, private firms provide a large portion of the initial vocational training, in Western Europe, public programs for the retraining of the unemployed are more popular. Some big firms have big training centers, and they either sell their training programs to other firms or train workers from other firms by mutual agreement. Some firms close their own training centers, preferring to rent the private ones.

Training provided by equipment manufacturers is a novelty in this area. It is urgently needed when enterprises use expensive and complex equipment that the educational institutions, seeking to train their students on the equipment, are incapable of buying.

Analysis of the development of professional education and vocational training organizational arrangements in a number of technologically advanced countries lets us state that they are currently searching for an optimum correlation between centralization and decentralization at various levels of management. National control in this area is being enhanced, becoming more flexible and efficient. Government is seeking nontraditional stimulation for including enterprises in a system of continual professional education and vocational training.

The USSR has a profound interest in these experiences. When converting to a market economy, the government's role as coordinator of national policies in education is increased. A comparative analysis of the advanced nations' experiences would be of great benefit for realizing this new role, as well as for new policies and new strategies for the development of professional education and vocational training.

# Socio-Psychological Approach to the Governance of the Pedagogical Staff in a Vocational School

Rafail H. Shakurov

Research reveals that one of the reasons for the low level of effectiveness of school administrators is a lack of attention to the socio-psychological factors in their functioning. Hence, the socio-psychological factors inherent in the administration of pedagogical staff are being introduced into the educational process in newly formed technical lyceums and colleges. The concept has been developed by this author based on the results of empirical research carried out for many years in a vocational secondary school. The concept is divided into the following basic models:

1. **Multi-level model of the structure of administrative functions**

   Unlike traditional models—which reduce management merely to planning, organizing people, directing, coordinating, managing, etc.—the new model emphasizes both the administrative and the socio-psychological goal functions such as:

   - Orientation of the pedagogical staff toward a given goal
   - Unification of the pedagogical staff
   - Stimulation of cooperation (vertical and horizontal types of relations; cooperation in management)
   - Stimulation of innovativeness in workers
   - Improvement (including innovation)

   The implementation of these functions will result in effective and efficient management. The personality of the managers and educators, as well as their activities, should be assessed in light of a multi-level model of administrative functions.

2. **Management style model of the pedagogical staff**

   Traditional models single out particular aspects of activities (autocratic-democratic, directive-consultative, dominative-integrative, etc.). Meanwhile, administrative activities are oriented toward the entire function of management. According to the systematic-functional concept, one can name three groups of qualities in assessing style: socio-psychological, business and trade, and administrative. The quality of government

much depends upon the harmonious nature of the entire structure of the management style.

3. **Model of administrative activities for implementing the basic socio-psychological functions of management: stimulating, uniting, organizing, improving**

   A detailed analysis will be given in the report (through extracts).

Because the experiment has only recently begun and is not yet finished, only the smaller part of the introduced concept has gone through practical approval. The research has led to working out the transferable methods and procedures for preliminary assessment of management and staff activities in the new type of technical lyceum. Also, measures for stimulating the labor and creative activities of pedagogical staff have been designed.

The major problems in the course of implementing this concept are connected with the difficulties in overcoming the old technocratic thinking and management style. The lack of socio-pedagogical knowledge and the necessary communication techniques add to the problem. We also have encountered numerous personality-psychological barriers. This creates many difficulties for the managers in governing socio-psychological administrative functions.

Thus, if the complexity index in planning measures 0.7, with the socio-psychological functions, it increases up to 1.3 to 1.5. One can believe that the introduction of socio-psychological models of management would demand a great and prolonged effort, varying in form, as these models appeal to an individual's and group's psychology.

# Problems of Staff Retraining for Small and Medium Businesses Converting to a Market Economy

Valentin Kharitonov

Five interrelated problems are confronting small- and medium-sized businesses in the USSR:

1. Trends underlying the significant recession in production during the recent period; for example:
   - Disturbance of interregional economic relations
   - Destruction of the out-of-date system of vertical distribution
   - Transition to horizontal relations
   - Weakening of legal institutions [and the binding force of legal norms]
   - Application of new taxation policy and formation of hard currency funds in enterprises according to the Resolution of the Council of Ministers of the USSR of December 8, 1990
   - Sharp decrease in capital investments and in the exchange value of the rouble
   - Violations of financial discipline
2. Basic factors defining modern conditions of national economy; namely:
   - Transition from large-scale industrial structures to small businesses—small enterprises, co-ops, joint ventures (both with Soviet and foreign partners), leasing of enterprises, and partial introduction of private business—as the most important measure for developing free enterprise
   - Decentralization of control of the national economy; transition to regional economics via local Soviets
   - Psychological inability to perceive market relations
3. Workforce at the state enterprises and its use; problems of staffing cuts due to conversion and production recession, etc.; lack of opportunities for obtaining new specialty and retraining

For this purpose, a new staff training and retraining structure should be conceived. The main ways at present of job placement are—

- Employment bureaus
- Contracts between educational establishments and enterprises
- Private contracts

4. Factors inhibiting the arrangement of staff training and retraining systems:
   - Rigid retraining programs, vertically controlled within the framework of the administrative economic system and the formation of planned needs
   - Conservative nature of the system: conditions of quasi-unchanging mass production, with a preset range of goods of almost unchanging quality, and insignificant changes in the processes used
   - Limited deviations in the development and approval of special retraining curricula
   - Increasing contradictions in tutelage given self-financing and self-repaying enterprises, lack of reasons to provide tutelage caused by conversion to a market economy

5. Customer's requirements for the staff training and retraining system:
   - Fast response to changes in demand for various specialties in a market economy
   - Ability to master new specialties, such as broker, marketing engineer, manager, etc.
   - More stringent requirements for the general level of employers, managers, etc.
   - Increased level of professional training
   - Additional requirements according to enterprise standards

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